



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/881,641	06/14/2001	Michael R. Foster	DP-302459 (DEP-0147)	7263
22851	7590	01/05/2006	EXAMINER	
DELPHI TECHNOLOGIES, INC. M/C 480-410-202 PO BOX 5052 TROY, MI 48007			TRAN, HIEN THI	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 01/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/881,641

Applicant(s)

FOSTER ET AL.

Examiner

Hien Tran

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/20/05 & 7/14/05.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-7,10,11,13,18,19 and 21-30 is/are pending in the application.
- 4a) Of the above claim(s) 21-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-7,10,11,13,18 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1,2,5-7,10,11,13,18,19 and 21-30 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 July 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "106" has been used to designate both the inside end (Fig. 15, page 10, line 11) and retaining device (Figs. 16-17; page 10, line 26+). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the drawings to comply with CFR 1.84(p)(5), e.g. they should include the reference sign(s) mentioned in the specification and vice versa.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

Art Unit: 1764

international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Foster (6,797,241).

With respect to claim 1, Foster discloses a non-thermal plasma reactor comprising:

a plasma-generating substrate 12, 14 having one or more flow paths for an exhaust gas;

a housing 38 having an inlet and an outlet;

a mat 24 retaining said plasma-generating substrate in said housing such that said one or more flow paths are in fluid communication with said inlet and said outlet; and

an electrically insulating layer 28, 31 disposed between said plasma-generating substrate and said housing for preventing an arc of electricity from said plasma-generating substrate and/or said voltage to said housing.

Note that a voltage is inherently supplied to said plasma-generating substrate for generating a plasma field (claims 1, 3, 10).

With respect to claim 5, Foster discloses that the insulating layer comprises a mica layer (claim 12)

Instant claims 1, 5 structurally read on the apparatus of Foster.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. The art area applicable to the instant invention is that of non-thermal plasma reactor.

One of ordinary skill in this art is considered to have at least a B.S. degree, with additional education in the field and at least 5 years practical experience working in the art; is aware of the state of the art as shown by the references of record, to include those cited by applicants and the examiner (*ESSO Research & Engineering V Kahn & Co*, 183 USPQ 582 1974) and who is presumed to know something about the art apart from what references alone teach (*In re Bode*, 193 USPQ 12, (16) CCPA 1977); and who is motivated by economics to depart from the prior art to reduce costs consistent with the desired product characteristics. *In re Clinton* 188 USPQ 365, 367 (CCPA 1976) and *In re Thompson* 192 USPQ 275, 277 (CCPA 1976).

8. Claims 2, 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foster (6,797,241) in view of Hemingway (6,464,945).

With respect to claims 2, 6, 8, the apparatus of Foster is substantially the same as that of the instant claims, but is silent as to the diffusion header.

Art Unit: 1764

However, Hemingway discloses the conventionality of providing a retaining device or diffusion header 76, 78 for diffusing exhaust gas to the plasma-generating substrate and away from the mat, the header having an end spaced apart from the substrate 22.

It would have been obvious to one having ordinary skill in the art to provide a retaining device in the apparatus of Foster, so as to retain the substrate within the housing and direct the exhaust gas to the substrate as taught by Hemingway as such is conventional in the art and no cause for patentability here.

With respect to claim 7, the specific distance from the header to the substrate is not considered to confer patentability to the claim. The precise distance from the header to the substrate would have been considered a result effective variable by one having ordinary skill in the art. As such, without more, the claimed distance from the header to the substrate cannot be considered "critical". Accordingly, one having ordinary skill in the art would have routinely optimized the distance from the header to the substrate in the system to obtain the desired retaining thereof (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

9. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foster (6,797,241) in view of Hemingway (6,464,945) as applied to claims 1-2, 5-7, 10-11 above, and further in view of Foster (6,159,430).

With respect to claims 10-11, the modified apparatus of Foster '241 is substantially the same as that of the instant claims, but fails to disclose peripheral extensions, sealant or seal ring.

Art Unit: 1764

However, Foster '430 discloses provision of peripheral extensions in close proximity to said inlet and outlet (col. 4, line 64 to col. 5, line 9); sealant 34 at the end of mat 32 (col. 5, lines 9-18) and annular end rings (col. 6, lines 34-40).

It would have been obvious to one having ordinary skill in the art to construct the substrate with peripheral extensions and sealant as taught by Foster '430 in the modified apparatus of Foster '241 so as to substantially shield the space surrounding the substrate and therefore to prevent the end of the mat from erosion by the hot exhaust gas.

It would have been obvious to one having ordinary skill in the art to provide annular end rings as taught by Foster '430 in the modified apparatus of Foster '241 for preventing movement of the mat material and providing a surface for the mat material to be compressed against.

10. Claims 13, 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foster (6,797,241) in view of Hemmingway (6,464,945), Foster (6,185,820) and Shoji et al (5,996,228).

With respect to claims 13, 18-19, the same teachings with respect to Foster '241 and Hemmingway apply.

Furthermore, the housing of Hemmingway includes the header with end plate as set forth above. Hemmingway further discloses provision of a compression stop (note the plates between the extension of the mat 74 at both ends and the end plates 78).

With respect to the specific density of the mat, Foster '820 discloses that the density of the mat is higher at the inlet and outlet ends to protect the mat from erosion by hot exhaust gas and the density can be 1.0 g/cc at the inlet and outlet ends and can be 0.5 g/cc at the central area of the converter. Shoji et al discloses provision of selecting a density of the mat within the instant range.

Art Unit: 1764

The specific density of the mat is not considered to confer patentability to the claim. As such, without more, the claimed density can not be considered "critical". Accordingly, one having ordinary skill in the art would have routinely optimized the density of mat in the system to obtain the desired purification thereof as evidenced by Foster '820 and Shoji et al (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

Double Patenting

11. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

12. Claims 1, 5 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of U.S. Patent No. 6,797,241 (Foster).

Although the conflicting claims are not identical, they are not patentably distinct from each other because they are directed to the same conceptual invention.

13. Claims 2, 6-7 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of U.S. Patent No. 6,797,241 (Foster) in view of Hemingway (6,464,945).

Art Unit: 1764

The same comments with respect to Hemingway apply.

14. Claims 10-11 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of U.S. Patent No. 6,797,241 (Foster) in view of Hemingway (6,464,945) as applied to claims 1-2, 5-7 above, and further in view of Foster (6,159,430).

The same comments with respect to Foster '430 apply.

15. Claims 13, 18-19 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of U.S. Patent No. 6,797,241 (Foster) in view of Hemingway (6,464,945), Foster (6,185,820) and Shoji et al (5,996,228).

The same comments with respect to Hemmingway, Foster '820 and Shoji et al apply.

Response to Arguments

16. Applicant's arguments filed 7/14/05 have been fully considered but they are not persuasive.

Applicants argue that Foster '241 does not disclose an insulation layer between the mat and the housing. Such contention is not persuasive as Foster '241 does disclose an insulation layer 28, 31 between the mat 24 and the housing 38.

Applicants argue that the mat of Hemmingway arranged against the housing with no electrically insulating layer therebetween. Such contention is not persuasive as Hemmingway is relied upon for teaching the conventionality of using a diffusion header for diffusing exhaust gas to the substrate and away from the mat. Whether Hemmingway does not disclose the insulating layer between the housing and the mat is irrelevant as the primary reference, Foster, is relied upon for such teaching.

Applicants argue that Foster '430 describes a catalytic converter that is not a non-thermal plasma reactor and does not include the electrical connections required for a non-thermal plasma reactor. Such contention is not persuasive as Foster '430 is only relied upon for teaching the specific peripheral extension and sealant or seal ring to substantially shield the space surrounding the substrate and prevent the end of the mat from erosion by the hot exhaust gas. Whether Foster '430 describes a catalytic converter that is not a non-thermal plasma reactor and does not include the electrical connections required for a non-thermal plasma reactor is irrelevant as the primary reference, Foster '241, is relied upon for such teaching.

Applicants argue that Foster '241 does not disclose provision of an end plate or a compression stop. Such contention is not persuasive as Hemmingway is relied upon for such teachings.

Conclusion

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hien Tran whose telephone number is (571) 272-1454. The examiner can normally be reached on Tuesday-Friday from 7:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1454. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HT

Hien Tran
Hien Tran
Primary Examiner
Art Unit 1764